

AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Previously presented) A transgenic plant cell comprising an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid, wherein the nucleic acid comprises a nucleotide sequence encoding a protein having an amino acid sequence with at least 95% identity with the sequence as set forth in SEQ ID NO: 4, wherein expression of said nucleic acid in the plant cell results in increased tolerance to an environmental stress associated with salinity, drought, and/or low temperature as compared to a non-transgenic wild type plant cell of the same species, and wherein the ORSRP is a heat-stable glutaredoxin protein.
- 2-4. (Canceled)
5. (Previously presented) The transgenic plant cell of claim 1, wherein the ORSRP coding nucleic acid encodes a protein with the sequence as set forth in SEQ ID NO: 4.
- 6-7. (Canceled)
8. (Previously presented) The transgenic plant cell of claim 1 wherein the plant cell is from a monocotyledonous plant.
9. (Previously presented) The transgenic plant cell of claim 1 wherein the plant cell is from a dicotyledonous plant.
10. (Previously presented) The transgenic plant cell of claim 1, wherein the plant cell is from a plant selected from the group consisting of maize, wheat, rye, oat, triticale, rice, barley, soybean, peanut, cotton, rapeseed, canola, manihot, pepper, sunflower, borage, safflower, linseed, primrose, rapeseed, turnip rape, tagetes, solanaceous plants, potato, tobacco, eggplant, tomato, Vicia species, pea, alfalfa, coffee, cacao, tea, Salix species, oil palm, coconut, perennial grass, forage crops and Arabidopsis thaliana.
11. (Previously presented) The transgenic plant cell of claim 1 wherein the plant cell is from a gymnosperm plant.
12. (Canceled)

13. (Previously presented) A transgenic plant comprising the plant cell according to claim 1, wherein the transgenic plant is a monocot or dicot plant.

14. (Canceled)

15. (Previously presented) A transgenic plant comprising the plant cell according to claim 1, wherein the transgenic plant is a gymnosperm plant.

16-17. (Canceled)

18. (Previously presented) A plant expression cassette comprising an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid having a nucleotide sequence operatively linked to a regulatory sequence and/or a targeting sequence for directing the ORSRP coding nucleic acid to an appropriate cell compartment, wherein the nucleotide sequence encodes a protein having an amino acid sequence with at least 95% identity with the sequence as set forth in SEQ ID NO: 4 and having the activity of a glutoredoxin.

19. (Previously presented) An expression vector comprising an Oxidoreductase Stress-Related Protein (ORSRP) encoding nucleic acid having a nucleotide sequence encoding a protein having an amino acid sequence with at least 95% identity with the sequence as set forth in SEQ ID NO: 4, or the plant expression cassette of claim 18, whereby expression of the ORSRP coding nucleic acid in a host cell results in increased tolerance to environmental stress as compared to a wild type host cell.

20-28. (Canceled)

29. (Previously presented) A method of producing a transgenic plant comprising an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid, wherein expression of the nucleic acid in the transgenic plant results in increased tolerance to environmental stress associated with salinity, drought, and/or low temperature as compared to a non-transgenic wild type plant of the same species, comprising

- a) transforming a plant cell with an expression vector comprising the nucleic acid,
- b) generating from the plant cell the transgenic plant with an increased tolerance to environmental stress as compared to a corresponding wild type plant,

wherein the nucleic acid comprises a nucleotide sequence encoding a protein having an amino acid sequence with at least 95% identity with the sequence as set forth in SEQ ID NO: 4, and wherein the ORSRP is a heat-stable glutaredoxin protein.

30-31. (Canceled)

32. (Previously presented) The method of claim 29, wherein the ORSRP coding nucleic acid encodes a protein with the sequence as set forth in SEQ ID NO: 4.

33-46. (Canceled)

47. (Previously presented) A method for preparing a plant cell with increased tolerance to an environmental stress associated with salinity, drought, and/or low temperature comprising transforming the plant cell with an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid comprising a nucleotide sequence encoding a protein having an amino acid sequence with at least 95% identity with the sequence as set forth in SEQ ID NO: 4, and expressing the ORSRP coding nucleic acid in the plant cell.

48. (Canceled)

49. (Previously presented) A method for selection of plants with increased tolerance to an environmental stress associated with salinity, drought, and/or low temperature comprising utilizing an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid comprising a nucleotide sequence encoding a protein having an amino acid sequence with at least 95% identity with the sequence as set forth in SEQ ID NO: 4 as a DNA marker, and selecting the plants with increased tolerance to an environmental stress associated with salinity, drought, and/or low temperature.

50. (Canceled)

51. (Previously presented) A transgenic plant comprising the transgenic plant cell of claim 1, wherein expression of the ORSRP coding nucleic acid in the transgenic plant further results in increased biomass production, photosynthetic yield, seed yield, and/or dry matter production as compared to a non-transgenic wild type plant of the same species.

52. (Previously presented) The method of claim 29, wherein expression of the ORSRP coding nucleic acid in the transgenic plant further results in increased biomass production,

photosynthetic yield, seed yield, and/or dry matter production as compared to a non-transgenic wild type plant of the same species.

53. (Previously presented) A method for preparing a plant with increased tolerance to an environmental stress associated with salinity, drought, and/or low temperature and increased biomass production, photosynthetic yield, seed yield, and/or dry matter production comprising:

a) obtaining a transformed plant cell expressing the ORSRP coding nucleic acid according to the method of claim 47, and

b) generating a transgenic plant from the transformed plant cell obtained in step a),
wherein expression of the ORSRP coding nucleic acid in the transgenic plant results in increased tolerance to an environmental stress associated with salinity, drought, and/or low temperature and increased biomass production, photosynthetic yield, seed yield, and/or dry matter production as compared to a non-transgenic wild type plant of the same species.

54. (Previously presented) A plant selected by the method of claim 49, wherein the plant further exhibits increased biomass production, photosynthetic yield, seed yield, and/or dry matter production as compared to a non-transgenic wild type plant of the same species.

55. (New) A method for modifying tolerance to at least one environmental stress in a plant comprising:

a) transforming a plant with an expression cassette comprising an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid sequence operably linked to a promoter, and

b) selecting a transgenic plant with modified tolerance to at least one environmental stress,

wherein expression of the ORSRP coding nucleic acid sequence in the transgenic plant confers modified tolerance to at least one environmental stress in said transgenic plant and wherein the ORSRP coding nucleic acid sequence encodes a protein comprising:

- i) the polypeptide sequence of SEQ ID NO: 4, or
- ii) a polypeptide sequence having at least 95% identity to the polypeptide sequence

of SEQ ID NO: 4.

56. (New) The method of claim 55, wherein the promoter is an inducible promoter.

57. (New) The method of claim 55, wherein the ORSRP coding nucleic acid sequence is in antisense orientation in said expression cassette.

58. (New) An expression cassette encoding a dsRNA molecule comprising:

a) a first nucleotide sequence comprising a portion of an Oxidoreductase Stress-Related Protein (ORSRP) coding nucleic acid sequence in sense orientation,

b) a second nucleotide sequence comprising the same portion of the ORSRP coding nucleic acid sequence in antisense orientation,

c) a promoter operably linked to the first nucleotide sequence of a) and the second nucleotide sequence of b), and

d) optionally, a linking sequence that links the first nucleotide sequence of a) and the second nucleotide sequence of b),

wherein the ORSRP coding nucleic acid sequence encodes a protein comprises:

i) the polypeptide sequence of SEQ ID NO: 4, or

ii) a polypeptide sequence having at least 95% identity to the polypeptide sequence of SEQ ID NO: 4.

59. (New) The expression cassette of claim 58, wherein the promoter is an inducible promoter.